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EXAMINER

MATHEWS, ALAN A

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/823,777	Applicant(s) KOLESNYCHENKO ET AL.	
	Examiner ALAN A. MATHEWS	Art Unit 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-20 and 22-48 is/are pending in the application.
- 4a) Of the above claim(s) 6,13,14,26,31,33,41-43 and 48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,7-9,12,15-20,22,23,25,27-30,32,34-39 and 44-47 is/are rejected.
- 7) ☒ Claim(s) 10,11,24 and 40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/25/08 & 9/26/08 & 11/13/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 13, 2008, has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 - 3, 7 - 9, 12, 15-20, 22, 23, 25, 27, and 44-47 are rejected under 35 U.S.C. 102(e) as being anticipated by Novak '181 (U. S. Patent Application Publication No. 2006/0023181 A1). It is first noted that Novak '181 is a family member of CN

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1771463 A, which was used in a rejection of the claims in a corresponding Chinese Application that was filed in Applicant's IDS filed 9/26/08. Novak '181 is a continuation of a PCT application filed in the US, the 102(e) date goes back to at least April 1, 2004 (but with a Provisional application being claimed in the reference, the date actually goes back to April 10, 2003). Novak '181 discloses in figure 1 a lithographic apparatus 10 having an illumination system 14, a support structure 18 to hold patterning device 28, a substrate table 20 to hold substrate 30, and a projection system 16. Figure 2A and paragraph # 0044 discloses a liquid supply system 252 (including nozzles 258) to supply a liquid to a localized area the substrate 30 (which is less than the area of a surface of the whole substrate). The liquid supply system 252 fills a space between the projection system 16 and the substrate 30. Figure 2A and Figure 2B and paragraphs # 0068 - # 0072 disclose a barrier which collects liquid. The barrier includes a groove (channel) 287 in a surface of the substrate table. Paragraph # 0071 discloses a first embodiment wherein the boundary region is on the same plane as the bottom of the wafer 30 and a second embodiment wherein the top surface of boundary region 280 can be approximately the same height as the top of the wafer 30. In this second embodiment, the **boundary region 280 would be considered to be a projection**, since 280 projects above the surface of the substrate table holding the substrate 30. The substrate 30 has some **thickness** and the substrate 30 lies on a top surface of the substrate table. Since the top surface of 280 is approximately the same height as the top surface of substrate 30 **in this second embodiment**, then 280 must project above the surface that holds the bottom of the substrate 30. Figure 2B would look different in

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this second embodiment, and would have the top surface of substrate 30 being the same height as the top surface of 280. The top surface of 280 would project up from the surface holding the bottom of the substrate 30. With respect to claims 3 and 47, paragraph # 0080 discloses the use of a hydrophilic (liquidphillic) coating. With respect to claims 7 and 22, paragraph # 0076 discloses a second recovery device 286 which includes a **low pressure source** that creates a low pressure in the collection region 284. Paragraph # 0076 further discloses that the second recovery device 286 can include multiple pumps, multiple reservoirs, valves, or other components. With respect to claims 12 and 25, element 290 could be considered to be a further groove (see figure 2C). With respect to claims 15 and 27, the first recovery system 254 in figure 2A could be considered the additional barrier. The barrier 280 and 287 would be positioned radially outwardly of the additional barrier 254. With respect to claims 16 and 17, figure 2C discloses the barrier extending around the outer edge. Furthermore, paragraph # 0072 discloses that the sloped region 282 is generally annular shaped, which means that the barrier extends substantially around an outer edge of portion of the substrate table. With respect to claim 18, the groove (boundary) surrounds the closure 254 configured to seal the liquid supply system. It is noted that claim 18 recites the alternative expression “and/or”. With respect to claim 44, element 290 could be considered two collecting recesses at opposite sides of the barrier (see figure 2C). With respect to claim 45, recesses 290 feed into an outlet.

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4. Claims 1, 2, 12, 15 – 20, 25, 27, 28, 30, 32, 35-38, and 44-47 are rejected under 35 U.S.C. 102(e) as being anticipated by Santen et al. (U. S. Patent Application Publication No. 2005/0134815 A1). Santen et al. '815 discloses in figure 1 a lithographic apparatus with a support structure MT configured to hold a patterning device MA and a substrate stage WT configured to hold a substrate W. Element PL is the projection system. Figure 4 and paragraphs # 0052 - # 0062 disclose a liquid supply system 10 which supplies liquid to a localized area (see in particular paragraphs # 008 and # 0018 which discuss supplying to a **localized area** and **collecting liquid that has spilled from the localized area of the supply system**). Element 50 in figure 4 is a barrier which comprises a projection which projects out above an upper surface of the substrate table and element 63 is considered to be a groove recessed into an upper surface of the substrate table. With respect to claims 12 and 25, element 66 is considered to be a further groove. With respect to claims 15, 27, and 28, element 66 is considered to be the drainage ditch or additional barrier, surrounding an outer peripheral edge of the substrate W. Barrier 50 and 63 is positioned radially outwardly of the drainage ditch 66. With respect to claims 16 and 35, barrier 50 extends substantially around an outer edge of portion of the substrate table. With respect to claim 17, figure 4 discloses that barrier 50 additionally surrounds areas of an upper surface of the substrate table which are not covered by the substrate W. With respect to claims 18 and 36, barrier 50 additionally surrounds sensor 70 and/or closure member 80.

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The applied reference has common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 7-9, 22, 23, 29, 34, 39, 46, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Santen et al. '815 as applied to claims 1, 19, and 28 above, and further in view of Novak '181. Santen et al. '815 discloses the invention except for disclosing that the barrier comprises liquidphillic material or coating and further comprising a low pressure supply configured to remove liquid from the barrier and providing a tilted ditch. Novak '181 discloses in paragraph # 0080 the use of hydrophilic (liquidphillic) coating for a barrier. Novak '181 further discloses in paragraph # 0076 a second recovery device 286 which includes a low pressure source that creates a low pressure in the collection region 284. Novak '181 discloses a tilted groove or ditch.

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With respect to claim 8, Santen et al.'815 discloses in paragraph # 0060 the use on one or more outlets 63. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide Santen et al. '815 with a barrier having liquidphillic material or coating and to provide Santen et al. '815 with a low pressure supply to remove liquid from the barrier and to provide a tilted ditch in view of Novak '181 for the purpose of improving the removal of liquid and thus producing a better final product.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Novak (U. S. Patent Application Publication No. 2006/0023181 A1) in view of either Santen et al. (U. S. Patent Application Publication No. 2002/0020821 A1, cited in one of Applicant's IDSs) or Novak et al.'182 (U. S. Patent Application Publication No. 2006/0023182, cited in one of Applicant's IDSs) or Loft et al. (U.S. Patent 6,952,253, cited in one of Applicant's IDSs). Novak '181 discloses the invention except for disclosing that the liquid can be transported along the groove under capillary action. Santen et al. '821 discloses in paragraphs # 0019 and # 0039 transporting a liquid by capillary liquid forces. Novak et al.'182 discloses in paragraphs # 0007 and # 0063, conveying liquid by capillary action. Lof et al. '253 discloses in column 5, lines 32-38, drawing liquid by capillary forces. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to transport the liquid in the grooves in Novak '181 by capillary forces in view of either Santen et al. '821 or Novak et al.'182 or Lof et al. '253 for the purpose of improving and simplifying the transportation of the liquid.

8. Claims 1-3, 7-9, 12, 15-23, 25, 27-30, 32, 34-39, and 44-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novak (U. S. Patent Application Publication No. 2006/0023181 A1) in view of the PCT Publication W0 99/49504. Novak '181 discloses in figure 1 a lithographic apparatus 10 having an illumination system 14, a support structure 18 to hold patterning device 28, a substrate table 20 to hold substrate 30, and a projection system 16. Figure 2A and paragraph # 0044 discloses a liquid supply system 252 (including nozzles 258) to supply a liquid to a localized area of the substrate 30. Figure 2A and Figure 2B and paragraph # 0044 discloses a second recovery system 256 which comprises a barrier to collect liquid. Figure 2A and Figure 2B and paragraphs # 0068 - # 0072 disclose that the barrier comprises a groove (channel) 287 including a sloped region 282 and a collection region 284. With respect to claims 3 and 29, paragraph # 0080 discloses the use of a hydrophilic (liquidphillic) coating. With respect to claim 7, paragraph # 0076 discloses a second recovery device 286 which includes a low pressure source that creates a low pressure in the collection region 284. The second recovery device 286 can include multiple pumps, multiple reservoirs, valves, or other components. With respect to claim 9, the second recovery device 286 is separate from immersion fluid source 260. With respect to claim 15, the groove 287 could be considered a drainage ditch. With respect to claims 16 and 17, paragraph # 0072 discloses that the sloped region 282 is generally annular shaped, which means that the barrier extends substantially around an outer edge or portion of the substrate table. Also, paragraph # 0071 discloses that the top surface of boundary

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region 280 is annular shaped. With respect to claims 18 and 36, the groove (boundary) surrounds the closure 254 configured to seal the liquid supply system. It is noted that claims 18 and 36 recite the alternative expression "and/or". Only one of the limitations is required to be shown when reciting an alternative expression. With respect to claim 28, in a different interpretation of Novak '181, groove 287 could comprise a drainage ditch. Thus, Novak '181 discloses the invention except for possibly disclosing a projection (**strong arguendo**) which projects out above an upper surface of the substrate table. W0 99/49504 discloses in the English translation (provided in this office action) on page 23, lines 21-24, providing a dividing wall that encloses the wafer, so that liquid does not overflow from the Z stage, and further providing a pipe for recovering liquid. In order to provide a dividing wall that encloses the wafer so that liquid does not overflow from the Z stage, this dividing wall in W0 99/49504 must project up from the substrate table. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide Novak '181 with a projection which projects out above an upper surface of the substrate table in view of the PCT Publication W0 99/49504 for the purpose of better confining the liquid so that liquid does not spill out to places that the liquid is not suppose to go and thus damage other lithographic equipment.

With respect to Applicant's arguments concerning the PCT Publication W0 99/49504, the Examiner maintains that the dividing wall would have to projection out of the upper surface of the substrate table in the PCT Publication W0 99/49504 in order for the liquid not to overflow from the Z stage as recited on page 23, lines 21-24 of the PCT

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Publication W0 99/49504. In addition, the PCT Publication W0 99/49504 states that the dividing wall encloses the wafer. Thus, the dividing wall surrounds the substrate, and would have to be spaced, at least to some extent, from the substrate. Otherwise one could not get the wafer out because the substrate would be “jammed” up against the wall with no space at all between the substrate and the wall.

Allowable Subject Matter

9. Claims 10, 11, 24, and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The reasons for the indicated allowability of the claims are as follows:

The prior art does not disclose or suggest further comprising a surface acoustic wave generator configured to generate surface acoustic waves in the barrier to facilitate transport of the liquid along the barrier in combination with all the other elements recited in independent claim 10.

The prior art does not disclose or suggest the step of generating surface acoustic waves in the barrier to facilitate transport of the liquid along the barrier in combination with all the other elements recited in independent claim 24.

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The prior art does not disclose or suggest wherein the substrate table further comprises a chamber in liquid contact with the upper surface via the groove and the chamber is a continuous annular chamber which has a cross-sectional area larger than that of the groove in combination with all the other elements recited in the parent claim to dependent claim 40.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The patents cited in the PTO-1449s are cited for the same reasons they were cited in Applicant's IDSs.

11. Claims 6, 13, 14, 26, 31, 33, 41-43, and 48 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALAN A. MATHEWS whose telephone number is (571)272-2123. The examiner can normally be reached on Monday through Friday from 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571) 272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alan A. Mathews/
Primary Examiner
Art Unit 2851

AM